MONROE RESERVOIR

Monroe and Brown Counties

2007 Fish Community Survey Report

David S. Kittaka

Fisheries Biologists

Fisheries Section
Indiana Department of Natural Resources
Division of Fish and Wildlife
I.G.C.-South, Room W273
402 W. Washington Street
Indianapolis, Indiana 46204

2008

EXECUTIVE SUMMARY

- Monroe Reservoir is a 10,750 acre flood control reservoir in Brown and Monroe Counties southeast of Bloomington, Indiana. It is the largest lake in the state, and recreational activities such as boating, fishing and hunting are very important. Monroe Reservoir also serves as the primary water supply for the City of Bloomington. A general fish community survey and fall targeted sampling survey for stocked predators were conducted in 2007.

- A total of 11,644 fish was collected between May 21 and June 6, 2007 (Appendix). Total weight for the survey was 2,948.35 lbs of fish. There were 27 fish species and 2 hybrids (hybrid sunfish and hybrid striped bass) collected. Twelve of these species are considered game fish. Some of these game species included; largemouth bass, white and black crappie, channel and flathead catfish, bluegill and yellow bass. Stocked game fish collected were hybrid striped bass and walleye.

- Largemouth bass catch rates have been consistent since 1992. Largemouth bass on average reach legal size by age 4, and overall, growth is good. Based on relative weights, Monroe bass are in excellent condition and are not forage limited.

- White crappie ranked second in abundance to gizzard shad. Eleven percent of the total catch was white crappie. White crappie ranged from 4.2 to15.4 in TL.

- Walleye grew well and on average reached legal size by age 2. The length range was 8.6 to 28.1 in TL. Seventy-two percent were legal size and greater. Better promotion of the walleye program at Monroe should be a priority.

- The hybrid striped bass stocking goal of 5/acre has been reached or exceeded the past 10 years. Growth is very good. A strong age-1 year class of hybrid striped bass was represented in the survey and should provide good hybrid fishing opportunities in the near future.

- The fishery overall is in excellent condition. Abundant and diverse angling opportunities present themselves at Monroe Reservoir. Promotion of this fishery should remain a high priority, as well as a means to protect it from aquatic nuisances and invasive plant and fish species.

INTRODUCTION

Monroe Reservoir is a 10,750 acre flood control reservoir in Brown and Monroe Counties southeast of Bloomington, Indiana. It is the largest lake in the state, and recreational activities such as boating, fishing and hunting are very important. Boat access is available at ten publicly-owned ramps located around the lake. In addition, several privately-owned recreational facilities such as boat rentals, sport shops, marinas, and campgrounds are available. Monroe Reservoir also serves as the primary water supply for the City of Bloomington.

At normal pool, the maximum depth of Lake Monroe is 54 ft with an average depth of 25 ft. The water level is regulated by the Army Corps of Engineers and is relatively stable, but may fluctuate up to 18 ft depending on storage needs. The lake is divided into two distinct basins which are separated by the State Highway (Hwy) 446 causeway (Figure 1). The upper basin receives 90% of the runoff entering the lake and is shallower and more turbid than the lower basin. During summer, oxygen concentrations in the lower basin are usually adequate for fish survival to depths of 16 to 20 ft. In the upper basin, adequate oxygen is normally present to a depth of about 15 ft.

Since impoundment in 1965, Monroe Reservoir has been managed primarily for largemouth bass and panfish fishing. A 14-in minimum size limit on largemouth bass has been in effect since 1973. As often occurs in new reservoirs, Monroe provided excellent fishing for several years after impoundment. Fishing quality began to level off as the reservoir aged, accompanied by increases in numbers of less desirable species such as yellow perch, yellow bass, and gizzard shad. Since the early 1980s, the lake's fish community has been characterized by an overabundance of forage fish and too few predator fish. Additional fish management practices at Monroe Reservoir have included several supplemental predator stockings. Early stockings included both northern pike and walleye, but were for the most part unsuccessful. Stockings in the last decade have included both walleye and hybrid striped bass. The intent of these stockings has been to provide additional fishing opportunities and utilize the surplus forage fish, particularly gizzard shad. In August of 1996, a 14-in minimum size limit was placed on walleye at the lake. Currently walleye are stocked at a rate of 50 per acre, for a target stocking of 537,500 spring fingerlings annually (Table 1). Hybrid striped bass are also stocked annually at a rate of five spring fingerlings per acre or 53,775 fingerlings (Table 2).

METHODS

In 2007, a comprehensive study of Monroe Reservoir took place. There was an assessment of the primary game fish, largemouth bass, through a mark and recapture population estimate, April 23 to May 15, 2007. An angler creel survey was conducted April 2 through October, 2007. A general fish community study was conducted May 28 through June 6, 2007. A supplemental evaluation of hybrid striped bass, walleye and catfish was also conducted October 15 to 30, 2007. The objectives of these surveys were to determine angler success through the angler creel survey, monitor and assess the growth and mortality of the primary game fishes and to assess the fish community as a whole.

The general fish community survey effort consisted of 6 h of DC night electrofishing, 24 overnight gill net sets, and 12 overnight trap net sets. Standard water chemistry parameters were collected. All fish were measured to the nearest 0.1 in TL. Weights of fish were taken to the nearest 0.01 lb on a sub-sample of fish by 0.1 in group. Scale samples were also taken from a sub-sample of all game species and gizzard shad for age and growth determination.

Targeted sampling for fall walleye, hybrid striped bass and catfish consisted of 8 h of electrofishing and 18 gill net lifts using the larger "striper" mesh size gill nets. Fish data collected was identical to the general survey, with the exception of the additional use of otoliths for age and growth determination. Otoliths were removed from gill net mortalities for walleye and hybrid striped bass. This report presents the results of the fish community and the fall supplemental evaluation surveys and recommendations for future work.

RESULTS

Standard water chemistry data were collected at the beginning of the survey (Appendix A). A dissolved oxygen (DO) and water temperature profile was conducted once a week for the duration of the survey. DO ranged from 5.26 to 7.02 ppm at the surface. Depth of oxygen adequate for fish survival ranged from 22 ft near the dam to 12 ft above the Hwy 446 causeway. Surface temperature ranged from 69^{o}F near the dam to 78^{o}F above the causeway three weeks later. Water clarity, measured with a Secchi disk, was 8 ft near the dam on May 21st and 1 ft 6 in above the causeway by June.

The aquatic vegetation survey consisted of targeted sampling near the major boat ramps. The primary vector of exotic aquatic vegetation infestations is likely unknowing boaters that

transport plant fragments on their boats or trailers. Eurasian watermilfoil has been present in past surveys and remains the predominant plant species at Monroe Reservoir. Other plants collected were coontail, brittle and slender naiad, American pondweed and curlyleaf pondweed.

A total of 11,644 fish was collected between May 21 and June 6, 2007 (Appendix B). Total weight for the survey was 2,948 lbs. There were 27 fish species and 2 hybrids (hybrid sunfish and hybrid striped bass) collected. Gizzard shad were the most abundant at 51% of the total catch followed white crappie (11%), bluegill (10.3%), yellow bass (9.4%), longear sunfish (6.3%), channel catfish (2.9%), largemouth bass (2.5%), spotfin shiner (1.5%), and hybrid striped bass (1.1%). Each of the remaining 20 species represented less than 1% of the total catch. Forty percent of the fish collected are considered game species.

A total of 5,898 gizzard shad, weighing 838 lbs was collected. They ranged from 5.3 to 11.1 in TL. Age data indicated five year classes were represented. Ages 1 and 2 made up the majority of the catch. Average length at capture was 7.1 and 7.7 in TL respectively, for these ages.

White crappie ranked second in abundance with 1,318 fish collected at a length range of 4.2 to 15.4 in TL. Twenty-seven percent of the crappie collected were 8 in TL and greater. Total weight of the fish collected was 339 lbs. Eight year classes were represented. The most abundant year class was age 2. Average length at capture for age-2 fish was 7 in TL. Crappie growth after age 1 and up to age 4 is approximately one inch a year. Growth of age 4 and older crappie is close to three inches a year. This is the size range that crappie begin to utilize young shad as forage. This is similar to the 2001 survey growth pattern for crappie (Schoenung 2002).

Bluegill ranked third in abundance with 1,203 fish collected. Bluegill ranged from 1.7 to 8.1 in TL. Total weight of bluegill collected was 109 lbs. PSD for bluegill was 26. Age data indicated there were seven year classes of fish collected and growth was average up to age 2. Growth for older fish was below average. This growth is consistent with past surveys.

Yellow bass ranked fourth in abundance with 1,090 collected. The length range was 3.6 to 9.2 in TL. Total weight for yellow bass was 123 lbs. The majority of the yellow bass collected were ages 1 and 2. Yellow bass can reach 7 in TL by age 2. There was also a strong year class at age 5. There were seven year classes represented.

A total of 732 longear sunfish was collected with a length range of 1.9 to 6.2 in TL. Longear sunfish are an abundant sunfish species but due to their small size are rarely considered a game fish.

There were 332 channel catfish collected ranging from 5.2 to 33.7 in TL. Forty-one percent of the channel catfish collected were 16 in TL and greater. The total weight of channel catfish collected was 527 lbs. This total ranked second by weight for the survey. Gill net catch rates increased since the 2001 survey. Catch per unit effort (CPUE) in 2001 was 6 fish/lift, compared to 13 fish/lift in 2007. The catch rate for channel catfish during the fall evaluation was 6 fish/lift. The larger mesh size was selective for larger fish and as a result the size range decreased to 10.4 to 31.6 in TL.

Largemouth bass comprised 2.5% of the total catch. There were 296 largemouth collected with a length range of 4.0 to 20.8 in TL and total weight of 335 lbs. The electrofishing catch rate for largemouth bass was 47 fish/h. The electrofishing catch rates, dating back to 1992, for largemouth bass ranged from a low of 40 fish/h in 1992 to a high of 64 fish/h in 2003. The PSD was 57, RSD 15 was 25 and RSD 20 was 1. A largemouth bass population estimate was conducted in early spring 2007. Age data was calculated from fish collected during that survey. Growth for Monroe bass is very good, with bass reaching legal size by age 4. Growth for bass has also been consistent since 2001 (Kittaka 2008).

Two smallmouth bass were collected during the general survey. There were also 10 smallmouth bass collected during the bass population estimate. Smallmouth bass ranged from 8.1 to 17.2 in TL. There were not enough collected to calculate a population estimate. Smallmouth bass were not collected in the previous survey in 2001. Reports of smallmouth bass catches from anglers are more common every year. The Division of Fish and Wildlife has never stocked smallmouth at Monroe Reservoir. The earliest record of smallmouth bass dates back prior to the filling of the reservoir. Rough fish were eradicated from the watershed. Game fish, including smallmouth bass, were salvaged from the incoming streams. When they began filling the lake in 1965 these fish were reintroduced. Since then, the DFW has not stocked any smallmouth bass (Personal Communication, Rex Watters, 2008).

Twelve spotted bass were also collected ranging from 7.6 to 12.3 in TL. There were four year classes of fish aged. Ages 2 through 5 were represented. No spotted bass were collected in 2001.

There were 123 hybrid striped bass collected with a length range of 4.9 to 24.1 in TL. Four year classes of hybrids were identified in the general survey. Approximately 50% were age 1. Stocking rates have been met or exceeded since 2001.

Larger mesh gill nets were used to target larger hybrids and walleye for the fall supplemental evaluation. There were 193 hybrids collected with a length range of 4.9 to 26.6 in TL. The YOY catch rate was 9 fish/h. In 2006, a surplus of hybrids was available, resulting in a stocking rate of 10 fish/acre. The high catch of age 1 fish is the result of the increased stocking. Targeting larger hybrids also increased year class representation to nine year classes. Otoliths were collected for age and growth analysis. Total annual mortality was 39% which is consistent with the 2005 evaluation of hybrid stripers when the mortality estimate was 33% (Kittaka 2005).

A total of 51 walleye was collected with a length range of 8.6 to 28.1 in TL. Total weight of walleye collected was 118 lbs. Seventy-two percent of the walleye collected were legal size and greater. There were eight year classes of fish collected. Monroe Reservoir walleye reach legal size by age 2.

There were 161 walleye collected during the fall evaluation with a length range of 6.0 to 28.3 in TL. Ten year classes of walleye were collected. Age-3 fish were the most abundant age for both the spring and fall evaluations. Mean TL for age-3 fish for spring and fall was 17.3 and 18.6 in TL, respectively. Monroe was stocked with 534,623 walleye fingerlings in 2007. The catch rate for YOY walleye was 12.75 fish/h. The target stocking rate of 50/acre has been met only two of the last 10 years. The average stocking rate for the last 10 years is 40/acre.

The weight of the 46 carp colleted was 301 lbs. This accounted for 10% of the total weight of the survey. Carp ranged from 9.0 to 32.0 in TL.

Additional game species collected were yellow perch (n=73) at a length range of 3.5 to 8.1 in, black crappie (n=52) at a length range of 4.6 to 13.8 in, and flathead catfish (n=13) with a length range of 9.0 to 23.0 in.

Other fish collected were spotfin shiner, brook silverside, logperch, warmouth, green sunfish, redear sunfish, bluntnose minnow, golden redhorse, golden shiner, black redhorse, spotted sucker, freshwater drum, silver lamprey, and hybrid sunfish.

DISCUSSION

Monroe Reservoir has a diverse fish community. The 27 fish species represents nine families of fish. Thirteen species are commonly sought by anglers. Electrofishing catch rates for largemouth bass have remained consistent since 1992. Young bass at Monroe have intense competition for the shad based forage with yellow bass and crappie, all of which spawn and grow at rates similar to bass. As young bass switch from aquatic insects to fish for food, so have the yellow bass and crappie. However, based on the consistent catch rates, it appears the bass population has reached equilibrium with the forage and competition for forage. Bass growth is good at Monroe as bass are reaching legal size, on average, in four years. Bass up to age 12 were collected.

Relative weights (Wr) [(Wr = (W/Ws)* 100] for stock densities were calculated to determine an index of condition for largemouth bass. Relative weight for stock size bass (8 to 11.9 in TL) was an average of 100.2. Wr for bass 12 to 13.9 in TL was an average of 106.1 and 14 to 20.5 in TL bass had an average Wr of 104.8. Wr indices of 95 to 100 are considered above average and indicate that Monroe bass are in excellent condition and are not forage limited (Anderson and Neumann 1996).

Monroe Reservoir has both white and black crappie. The majority of the collected crappies were white crappie. Water quality and available habitat is more conducive to white crappie. Crappie growth is similar to past surveys. In 2001, the growth pattern was described as a bottleneck where young yellow bass and crappie are both predator and prey competing for the same forage, reducing growth for crappie. A small percentage is able to reach a size to utilize young shad and grow quickly as is demonstrated in the 2007 age assessment. Crappie at age 2 and 3 were stunting at 7 in TL. Between ages 4 and 5 there was on average a 4 in TL increase in length (Mean TL 8.9 in at age 4 and 12.5 in at age 5).

Walleye were collected during the general survey and the fall supplemental evaluation. Walleye at Monroe reach legal size by age 2. On average they grew 3.6 in from spring to fall at age 1 and 4.0 in at age 2. As walleye mature, sexual dimorphism becomes apparent for age 3 and older fish. The fast growing females pass the slow growing males. Around 25 in TL the age difference becomes less apparent as most of the fish this length are females.

Catch rates for walleye in the spring and fall of 2007 were similar to the catch rates in the last supplemental survey in 2005. Electrofishing catch rates for YOY walleye were 28/h in

2004, 7.5/h in 2005, 5.6/h in 2006, and 12.8/h in 2007. A success criterion for YOY fall walleye evaluations is 7 fish/h when the stocking rate is 100 per acre. Monroe's stocking rate is 50 per acre so the target rate is 3.5/h. Over the past ten years, the actual stocking rate for Monroe averaged 40 fingerlings/acre. This may indicate that the stocking rate of 50/acre could be reduced and still achieve the stocking survival success criteria. Better promotion of Monroe walleye in the future should be a priority.

Hybrid striped bass are becoming a major component of this fishery. The ten year average stocking rate is 7 fish/acre. In 2006, a radio tracking study of hybrid striped bass was conducted (Hoffman 2007). Not only did it establish seasonal home ranges and associated habitat, but it also sparked angler interest in this fishery. There was a noticeable increase in the number of hybrid inquiries and request for angling information.

Channel and flathead catfish catches have remained consistent from the last survey. The length range and CPUE are similar. Populations of both species appear stable and plenty of young catfish of both species indicate good recruitment.

In the 2001 survey, a decline in the amount of submersed and emergent vegetation was noted. Since then, Eurasian watermilfoil has increased its distribution. However, annual water level fluctuations in the spring and summer over the past couple of years have resulted in inconsistent location and size of submersed vegetation beds.

In the 2006 Indiana fish consumption advisory, Monroe Reservoir had a group 1 rating for bluegill up to 7 in TL and carp up to 21 in TL (Indiana 2006). A group 1 rating means that there are no restrictions on eating fish for the general population. Consumption ratings for all game species at Monroe were not listed. However, these two fish represent the species that are most likely (carp) and least likely (bluegill) to have contaminants issues.

During the 2007 fall supplemental evaluation and the spring bass population estimate there were four grass carp and a single white bass collected. The grass carp ranged from 38.0 to 38.5 in TL, indicating these fish most likely escaped or were released at the same time. At this time there are no signs of natural reproduction of grass carp. Legally purchased grass carp are a triploid strain and are considered sterile. In time these fish will die of old age. Discovery of this exotic species brings to the forefront the issue of exotic species and the importance of education and identification. New and innovative means of educating the public should be pursued to protect this resource.

RECOMMENDATIONS

- The Division of Fish and Wildlife needs to develop and implement programs to promote the walleye fishery.

- The Division of Fish and Wildlife needs to develop and implement programs to promote the channel catfish and flathead catfish fishery.

- The Division of Fish and Wildlife needs to develop innovative programs to prevent to introduction of exotic species.

LITERATURE CITED

Anderson, R.O. and R.M. Neumann. 1996. Length, weight, and structural indices. 447-482pp in B.R. Murphy and D. W. Willis, editor. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

Hoffman, K. 2006-07, Hybrid striped bass movements at Lake Monroe, Indiana Department of Natural Resources, Indianapolis, IN, unpublished 2007.

Kittaka, D.S. 2005. Supplemental evaluation of Monroe Reservoir walleye, Hybrid striped bass, largemouth bass, and channel catfish 2005. Indiana Department of Natural Resources, Indianapolis, IN.

Watters, Rex. 2008. Property Biologist, Monroe Reservoir, Indiana Department of Natural Resources. Personal Communication.

Schoenung B.M. 2002, Monroe Reservoir Fish Management Report, 2001. Indiana Department of Natural Resources, Indianapolis, IN.

2006 Indiana fish consumptions advisory, Indiana State Department of Health, Indiana Department of Environmental Management, Indiana Department of Natural Resources, 20pp.

Submitted by: David S. Kittaka, Fisheries Biologist
Date: February 14, 2008

Approved by: Brian M. Schoenung, Fisheries Supervisor

Date: April 30, 2008

Appendix A

Lake water chemistry
Sampling effort locations
Hybrid striped bass and walleye stocking history

Hybrid striped bass stocking history of Monroe Reservoir by year, number stocked, fish/acre and length.

Year	Number Stocked	Fish/Acre	Length (inches)
1983	58,282	5.4	1-2
1984	100,000	9.3	1-2
1985	44,450	4.1	1-2
1986	107,000	10	Fry
1987	0		
1988	10,710	1	2
1989	75,250	7	2
1990	53,760	5	1-2
1991	53,750	5	1-2
1992	54,716	5.1	1-2
1993	90,306	8.4	1-2
1994	6,618	0.6	2.3
1995	0		
1996	51,500	4.8	2.2
1997	108,112	10.1	1.2
1998	161,250	15	1.5
1999	53,750	5	1.5
2000	5,732	0.5	2-3
2001	96,942	9	1-2
2002	115,848	10.8	1-2
2003	47,448	4.4	1-2
2004	50,000	4.7	3.5
2005	64,655	6	1-2
2006	107,500	10	1.23
2007	54,193	5	1.1-2.1

Walleye stocking history of Monroe Reservoir by year, number stocked, fish/acre and length.

Year	Number Stocked	Fish/Acre	Length (inches)
1982	73,700	6.8	1-2
1983	0		
1984	0		
1985	8,300	0.8	3
1986	48,147	4.5	1-2
1987	37,853	3.5	3
1988	573,094	53.3	1-2
1989	524,362	48.8	1-2
1990	642,392	59.8	1-2
1990	11,255,325	1,047	Fry
1991	461,102	42.9	1.5-2.5
1992	541,766	50.4	1-2
1993	523,720	48.7	1-2
1994	441,284	41	1-2
1995	538,467	50.1	1-2
1996	746,075	69.4	1-2
1997	801,791	74.6	1-2
1998	285,675	26.6	1-2
1999	563,030	52.4	1-2
2000	547,347	50.9	1-2
2001	293,001	27.3	1.5-2.5
2002	447,378	41.6	1-2
2003	337,789	31.4	1-2
2004	416,696	38.8	1-2
2005	351,175	32.7	1.5-2.0
2006	494,268	45.9	1.13-1.46
2007	534,623	49.7	1.0-3.8

LAKE SURVEY REPORT

Type of Survey: [ ] Initial Survey [X] Re-Survey

Lake Name	County	Date of survey (Month, day, year)
Monroe Reservoir	Monroe	5/21/07- 6/6/07
Biologist's name		**Date of approval (Month, day, year)**
Dave Kittaka, Deb King, Aaron McAlexander		4/30/2008

LOCATION		
Quadrangle Name	Range	Section
Clear Creek, Indiana	1W	27
Township Name	Nearest Town	
7N	Bloomington, IN	

ACCESSIBILITY					
State owned public access site			Privately owned public access site		Other access site
Nine state-operated & 1 Federal-operated boat ramps					Three boat liveries
Surface acres	Maximum depth	Average depth	Acre feet	Water level	Extreme fluctuations
10,750	54 Ft.	25 Ft.	268,750	538 Ft. MSL	17 Ft.
Location of benchmark					
523					

INLETS		
Name	Location	Origin
North Fork Salt Creek	Belmont & Nashville Quads	T9N, R4E, S19
Middle Fork Salt Creek	Elkinsville, Story	
South Fork Salt Creek	Elkinsville, Story, Kurtz & Brownstown	

OUTLETS	
Name	Location
Salt Creek	Two miles east of Harrodsburg, Indiana
Water level control	

POOL	ELEVATION (Feet MSL)	ACRES
TOP OF DAM	574	
TOP OF FLOOD CONTROL POOL	556	18,600
TOP OF CONSERVATION POOL	538	10,750
TOP OF MINIMUM POOL	515	3,280
STREAMBED		

Bottom type

- [ ] Boulder
- [X] Gravel
- [X] Sand
- [X] Muck
- [X] Clay
- [ ] Marl

Watershed use

Brown County State Park, Yellowwood State Forest, Hoosier National Forest, agricultural.

Development of shoreline

State and private camping areas, bait shops, marinas, sport shops, motels, residential, etc.

Previous surveys and investigations

Fisheries surveys: 1965-1972, 1979, 1980, 1982, 1984-1987, 1988, 1992, 2001 Embayment sampling: 1967-1969, 1973-1976, 1978. Creel surveys: 1967, 1969, 1970, 1991, 1994, 2000. IU limnological investigations: 1966-1969 & 1974-1975. IU Food Habits Study: 1970, IU Benthos Study: 1971. Supplemental walleye, largemouth bass and hybrid striped bass evaluations, 2004,2005,2006.

SAMPLING EFFORT Monroe Reservoir week of 5/21/07					
ELECTROFISHING	Day hours		Night hours		Total hours
	N/A		6		6
TRAP NETS	Number of traps		Number of Lifts		Total effort
	2		6		12
GILL NETS	Number of nets		Number of Lifts		Total effort
	4		6		24
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

PHYSICAL AND CHEMICAL CHARACTERISTICS	
Color	Turbidity
Green	8 Feet 0 Inches (SECCHI DISK)
Alkalinity (ppm)*	pH
Surface: 17.1 Bottom:	Surface: 8.3 Bottom:
Conductivity: 120 µS	Air temperature: °F
Water chemistry GPS coordinates: N 39.01528	W -86.51596

TEMPERATURE AND DISSOLVED OXYGEN (D.O.)								
DEPTH (FEET)	Degrees (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)
SURFACE	69.4	5.94	36	53.2	2.84	72		
2	69.1	6.21	38	53.1	2.95	74		
4	68.4	6.20	40	52.9	3.09	76		
6	68.2	6.19	42	52.5	2.99	78		
8	68.0	5.97	44	52.5	2.92	80		
10	67.1	6.00	46	52.5	2.87	82		
12	66.2	5.87	48	52.5	2.83	84		
14	65.8	5.93	49 bottom			86		
16	65.7	6.05	52			88		
18	65.3	5.96	54			90		
20	63.7	5.64	56			92		
22	61.5	4.96	58			94		
24	58.8	4.52	60			96		
26	58.1	4.35	62			98		
28	65.3	3.90	64			100		
30	54.9	3.47	66					
32	53.8	3.12	68					
34	53.4	2.92	70					

COMMENTS
Data collected near Dam

*ppm-parts per million

SAMPLING EFFORT Monroe Reservoir week of 5/28/07					
ELECTROFISHING	Day hours		Night hours		Total hours
	N/A		6		6
TRAP NETS	Number of traps		Number of Lifts		Total effort
	2		6		12
GILL NETS	Number of nets		Number of Lifts		Total effort
	4		6		24
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

PHYSICAL AND CHEMICAL CHARACTERISTICS			
Color		Turbidity	
Green		8 Feet	0 Inches (SECCHI DISK)
Alkalinity (ppm)*		pH	
Surface:	Bottom:	Surface:	Bottom:
Conductivity:	µS	Air temperature:	°F
Water chemistry GPS coordinates:	N 39.05228	W	-86.47763

TEMPERATURE AND DISSOLVED OXYGEN (D.O.)								
DEPTH (FEET)	Degrees (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)
SURFACE	77.0	7.02	36			72		
2	77.3	7.30	38			74		
4	77.2	7.47	40			76		
6	76.8	7.55	42			78		
8	75.7	7.76	44			80		
10	74.7	7.84	46			82		
12	73.8	7.77	48			84		
14	70.7	6.46	50			86		
16	67.1	5.35	52			88		
18	64.8	3.82	54			90		
20 bottom	63.5	2.53	56			92		
22			58			94		
24			60			96		
26			62			98		
28			64			100		
30			66					
32			68					
34			70					

COMMENTS
Data collected near Fairfax

*ppm-parts per million

SAMPLING EFFORT Monroe Reservoir week of 6/4/07					
ELECTROFISHING	Day hours		Night hours		Total hours
	N/A		6		6
TRAP NETS	Number of traps		Number of Lifts		Total effort
	2		6		12
GILL NETS	Number of nets		Number of Lifts		Total effort
	4		6		24
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

PHYSICAL AND CHEMICAL CHARACTERISTICS	
Color	Turbidity
	1 Feet 6 Inches (SECCHI DISK)
Alkalinity (ppm)*	pH
Surface: 34.2 Bottom:	Surface: Bottom:
Conductivity: µS	Air temperature: 78.6 °F
Water chemistry GPS coordinates: N 39.07350143	W -86.4071682

TEMPERATURE AND DISSOLVED OXYGEN (D.O.)								
DEPTH (FEET)	Degrees (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)
SURFACE	78.6	5.26	36			72		
2	78.6	5.14	38			74		
4	78.4	5.18	40			76		
6	78.3	5.14	42			78		
8	77.7	5.48	44			80		
10	77.2	5.43	46			82		
12	76.5	4.88	48			84		
14	75.2	3.43	50			86		
16	73.0	2.10	52			88		
18	72.5	1.87	54			90		
20	72.0	1.82	56			92		
22	bottom		58			94		
24			60			96		
26			62			98		
28			64			100		
30			66					
32			68					
34			70					

COMMENTS
Data collected above causeway

*ppm-parts per million

SAMPLING LOCATIONS BY EQUIPMENT MONROE RESERVOIR 2007														
GILL NETS					TRAP NETS					ELECTROFISHING				
1 GN	N	39.03187	W	-86.49792	1	N	39.03120	W	-86.50064	1	N	39.01098	W	-86.48662
1 GN	N	39.03115	W	-86.49800	2	N	39.01989	W	-86.49950	2	N	39.02403	W	-86.51012
2 GN	N	39.02254	W	-86.49762	3	N	39.01175	W	-86.48967	3	N	39.02403	W	-86.51012
2 GN	N	39.02223	W	-86.49838	4	N	39.01443	W	-86.48702	4	N	39.01269	W	-86.51293
3 GN	N	39.02425	W	-86.51650	5	N	39.05179	W	-86.48007	5	N	39.03823	W	-86.44409
3 GN	N	39.02472	W	-86.51715	6	N	39.05814	W	-86.47473	6	N	39.03669	W	-86.46374
4 GN	N	39.00817	W	-86.51246	7	N	39.07855	W	-86.45920	7	N	39.03298	W	-86.46168
4 GN	N	39.00881	W	-86.51187	8	N	39.08803	W	-86.45388	8	N	39.01297	W	-86.46136
5 GN	N	39.00135	W	-86.47315	9	N	39.06703	W	-86.39679	9	N	39.06991	W	-86.42306
6 GN	N	39.00209	W	-86.47302	10	N	39.07479	W	-86.38859	10	N	39.06063	W	-86.43051
7 GN	N	39.00487	W	-86.46661	11	N	39.08553	W	-86.39359	11	N	39.04464	W	-86.43557
8 GN	N	39.01979	W	-86.46229	12	N	39.07954	W	-86.40044	12	N	39.05506	W	-86.45713
8 GN	N	39.02029	W	-86.46299						13	N	39.09072	W	-86.45595
9 GN	N	39.01137	W	-86.46068						14	N	39.08537	W	-86.45963
9 GN	N	39.01138	W	-86.46179						15	N	39.07776	W	-86.45655
10 GN	N	39.05259	W	-86.48244						16	N	39.07980	W	-86.44705
10 GN	N	39.05326	W	-86.48140						16*	N	39.07654	W	-86.44488 *
11 GN	N	39.05896	W	-86.47557						17	N	39.08488	W	-86.40095
11 GN	N	39.05821	W	-86.47549						18	N	39.07714	W	-86.38925
12 GN	N	39.03975	W	-86.48224						19	N	39.06182	W	-86.39186
12 GN	N	39.04053	W	-86.48197						20	N	39.06036	W	-86.38754
13 GN	N	39.02996	W	-86.48476						21	N	39.06358	W	-86.36914
13 GN	N	39.03064	W	-86.48465						22	N	39.07292	W	-86.36360
14 GN	N	39.09070	W	-86.45789						23	N	39.07273	W	-86.36771
14 GN	N	39.09007	W	-86.45837						24	N	39.08260	W	-86.37521
15 GN	N	39.09303	W	-86.46265										
15 GN	N	39.09318	W	-86.46259										
16 GN	N	39.06770	W	-86.42630										
17 GN	N	39.07426	W	-86.41705										
18 GN	N	39.07914	W	-86.36513										
18 GN	N	39.07940	W	-86.36581										
19 GN	N	39.07277	W	-86.36353										
19 GN	N	39.07343	W	-86.36407										
20 GN	N	39.07470	W	-86.37659										
20 GN	N	39.07538	W	-86.37712										
21 GN	N	39.06229	W	-86.39144										
21 GN	N	39.06193	W	-86.39066										
22 GN	N	39.08565	W	-86.39103										
22 GN	N	39.08516	W	-86.39196										
23 GN	N	39.10081	W	-86.40723										
23 GN	N	39.10040	W	-86.40805										
24 GN	N	39.09513	W	-86.41115										
24 GN	N	39.09524	W	-86.41016										

* changed station because of low water

Appendix B

Relative abundance of fish collected
Fish age-length keys and growth summaries
Fish by length frequency

SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT AT MONROE 2007					
*COMMON NAME OF FISH	NUMBER	PERCENT	LENGTH RANGE (inches)	WEIGHT (pounds)	PERCENT
Gizzard shad	5898	50.64	5.3-11.1	838.08	28.41
White crappie	1318	11.32	4.2-15.4	339.28	11.50
Bluegill	1203	10.33	1.7-8.1	109.32	3.71
Yellow bass	1090	9.36	3.6-9.2	122.74	4.16
Longear sunfish	731	6.28	1.9-6.2	50.27	1.70
Channel catfish	332	2.85	5.2-33.7	526.53	17.85
Largemouth bass	296	2.54	4.0-20.8	334.52	11.34
Spotfin shiner	177	1.52	2.0-4.2	1.97	0.07
White bass x Striped bass	123	1.06	4.9-24.1	127.54	4.32
Yellow perch	73	0.63	3.5-8.1	7.12	0.24
Brook silverside	71	0.61	2.7-4.2	0.68	0.02
Log perch	54	0.46	3.6-6.3	1.73	0.06
Black crappie	52	0.45	4.6-13.8	10.63	0.36
Walleye	51	0.44	8.6-28.1	117.59	3.99
Warmouth	47	0.40	3.9-8.2	9.63	0.33
Common carp	46	0.39	9.0-32.0	301.24	10.21
Green sunfish	16	0.14	2.5-6	0.95	0.03
Redear sunfish	16	0.14	5.7-9.1	5.48	0.19
Flathead catfish	13	0.11	9.0-23.3	21.44	0.73
Spotted bass	12	0.10	7.6-12.3	4.96	0.17
Bluntnose minnow	10	0.09	2.2-3.4	0.08	0.00
Golden redhorse	5	0.04	11.9-17.9	8.35	0.28
Golden shiner	3	0.03	4.0-8.0	0.30	0.01
Black redhorse	2	0.02	14.4-16.8	3.08	0.10
Smallmouth bass	2	0.02	9.6-13.3	1.54	0.05
Spotted sucker	2	0.02	8.9-13.3	1.14	0.04
Freshwater drum	1	0.01	19.0	3.81	0.13
Silver lamprey	1	0.01	9.4	0.09	0.00
Hybrid sunfish	1	0.01	5.2	0.11	0.00
TOTAL	11,646	100.00		2950.20	100.00

*Common names of fishes recognized by the American Fisheries Society.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OFMonroe Reservoir Gizzard shad 5-6/07									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0					22.0				
4.5					22.5				
5.0	26	0.4	0.17	1	23.0				
5.5	8	0.1	0.05	1	23.5				
6.0	17	0.3	0.07	1	24.0				
6.5	639	10.8	0.10	1,2	24.5				
7.0	2260	38.3	0.12	1,2	25.0				
7.5	1411	23.9	0.14	2	25.5				
8.0	849	14.4	0.16	2	26.0				
8.5	395	6.7	0.19	2	TOTAL	5898	100		
9.0	134	2.3	0.23	2,3					
9.5	109	1.9	0.27	2,3					
10.0	25	0.4	0.31	3					
10.5	17	0.3	0.40	4					
11.0	8	0.1	0.43	6					
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	885/hr	GILL NET CATCH	24 /lift	TRAP NET CATCH	1 /lift

* Average weights derived from district averages

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Monroe Reservoir White crappie 5-6/07									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0	4	0.3	0.04	1	22.0				
4.5	36	2.7	0.05	1	22.5				
5.0	157	11.9	0.06	1	23.0				
5.5	22	1.7	0.08	1,2,3	23.5				
6.0	66	5.0	0.11	2	24.0				
6.5	263	20.0	0.13	2,3	24.5				
7.0	248	18.8	0.16	2,3	25.0				
7.5	172	13.1	0.20	2,3	25.5				
8.0	128	9.7	0.23	2,3,4	26.0				
8.5	49	3.7	0.28	2,3,4	TOTAL	1318	100		
9.0	21	1.6	0.32	4					
9.5	6	0.5	0.36	4,5					
10.0									
10.5	2	0.1	0.55	5					
11.0	22	1.6	0.64	4,5,6					
11.5	38	2.9	0.78	5,6					
12.0									
12.5	1	0.1	1.05	5					
13.0	18	1.4	1.10	5,6					
13.5	20	1.5	1.19	5,6					
14.0	9	0.7	1.35	6					
14.5	28	2.1	1.47	5,8					
15.0	9	0.7	1.88	7					
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	9/hr	GILL NET CATCH	33/lift	TRAP NET CATCH	40/lift

* Average weights derived from district averages

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Monroe Reservoir Bluegill 5-6/07									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5	21	1.8	0.01	1	19.5				
2.0	67	5.5	0.01	1	20.0				
2.5	115	9.5	0.02	1	20.5				
3.0	72	6.0	0.02	2	21.0				
3.5	125	10.4	0.04	2	21.5				
4.0	137	11.4	0.05	2	22.0				
4.5	139	11.6	0.07	2,3	22.5				
5.0	148	12.3	0.09	2,3,5	23.0				
5.5	100	8.3	0.12	3,4	23.5				
6.0	125	10.4	0.16	4,5,6	24.0				
6.5	80	6.7	0.22	4,5,6,7	24.5				
7.0	51	4.2	0.27	4,5	25.0				
7.5	22	1.8	0.34	4,5,6	25.5				
8.0	2	0.1	0.42	4	26.0				
8.5					TOTAL	1203	100		
9.0									
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	177/hr	GILL NET CATCH	1/lift	TRAP NET CATCH	9/lift

* Average weights derived from district averages

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Monroe Reservoir Longear sunfish 5-6/07									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5	3	0.4	0.01		19.5				
2.0	37	5.1	0.01		20.0				
2.5	37	5.1	0.02		20.5				
3.0	113	15.5	0.03		21.0				
3.5	125	17.1	0.05		21.5				
4.0	141	19.3	0.07		22.0				
4.5	122	16.6	0.09		22.5				
5.0	118	16.1	0.11		23.0				
5.5	30	4.1	0.15		23.5				
6.0	5	0.7	0.17		24.0				
6.5					24.5				
7.0					25.0				
7.5					25.5				
8.0					26.0				
8.5					TOTAL	731	100		
9.0									
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	117 /hr	GILL NET CATCH	1/lift	TRAP NET CATCH	1/lift

* Average weights derived from district averages

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Monroe Reservoir Yellow bass 5-6/07									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5	12	1.7	0.03	1	21.5				
4.0	152	21.6	0.03	1	22.0				
4.5	192	27.2	0.04	1	22.5				
5.0	7	1.0	0.05	1	23.0				
5.5	5	0.7	0.11	2	23.5				
6.0	25	3.5	0.11	2	24.0				
6.5	121	17.2	0.13	2,3	24.5				
7.0	92	13.0	0.16	2,4	25.0				
7.5	39	5.5	0.19	3,5,6	25.5				
8.0	42	6.0	0.24	4,5,6,7	26.0				
8.5	13	1.8	0.10	5,6,7	TOTAL	705	100		
9.0	5	0.7	0.18	5,6,7					
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	94/hr	GILL NET CATCH	6/lift	TRAP NET CATCH	0/lift

* Average weights derived from district averages

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Monroe Reservoir Channel catfish 5-6/07									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0	13	3.9	2.44	
1.5					19.5	5	1.5	2.75	
2.0					20.0	13	3.9	2.89	
2.5					20.5	6	1.8	3.05	
3.0					21.0	5	1.5	3.01	
3.5					21.5	4	1.2	3.32	
4.0					22.0	1	0.3	4.10	
4.5					22.5	8	2.4	4.65	
5.0	2	0.6	0.03		23.0	3	0.9	4.87	
5.5	1	0.3	0.06		23.5	2	0.6	4.96	
6.0					24.0	2	0.6	4.72	
6.5	1	0.3	0.10		24.5	3	0.9	6.20	
7.0					25.0	3	0.9	6.25	
7.5	2	0.6	0.13		25.5	1	0.3	5.30	
8.0	4	1.2	0.17		26.0	1	0.3	7.50	
8.5	9	2.7	0.18		26.5	1	0.3	8.00	
9.0	16	4.8	0.22		27.0	1	0.3	7.50	
9.5	10	3.0	0.26		27.5				
10.0	8	2.4	0.28		28.0	1	0.3	8.00	
10.5	11	3.3	0.35		28.5				
11.0	10	3.0	0.40		29.0	1	0.3	10.00	
11.5	15	4.5	0.49		29.5				
12.0	12	3.6	0.53		30.0				
12.5	17	5.1	0.60		30.5				
13.0	18	5.4	0.68		31.0				
13.5	10	3.0	0.77		31.5				
14.0	13	3.9	0.86		32.0				
14.5	11	3.3	0.93		32.5				
15.0	16	4.8	1.14		33.0				
15.5	9	2.7	1.13		33.5	1	0.3	17.50	
16.0	5	1.5	1.40		Total	332			
16.5	11	3.3	1.42						
17.0	9	2.7	1.64						
17.5	13	3.9	1.70						
18.0	11	3.3	2.00						
18.5	13	3.9	2.02						

ELECTROFISHING CATCH	1/hr	GILL NET CATCH	13/lift	TRAP NET CATCH	0/lift

* Average weights derived from district averages

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Monroe Reservoir Largemouth bass 5-6/07									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0	4	1.4	4.35	
1.5					19.5	2	0.7	4.74	
2.0					20.0	1	0.3	5.75	
2.5					20.5	2	0.7	4.50	
3.0					21.0				
3.5					21.5				
4.0	4	1.35	0.03		22.0				
4.5	4	1.35	0.04		22.5				
5.0	9	3.04	0.06		23.0				
5.5	5	1.69	0.08		23.5				
6.0	11	3.72	0.11		24.0				
6.5	7	2.36	0.14		24.5				
7.0	7	2.36	0.17		25.0				
7.5	3	1.01	0.22		25.5				
8.0	2	0.68	0.24		26.0				
8.5	8	2.70	0.30		TOTAL	296	100		
9.0	16	5.41	0.34						
9.5	23	7.77	0.42						
10.0	12	4.05	0.52						
10.5	11	3.72	0.60						
11.0	22	7.43	0.68						
11.5	15	5.07	0.80						
12.0	16	5.41	0.93						
12.5	16	5.41	1.12						
13.0	12	4.05	1.23						
13.5	11	3.72	1.38						
14.0	10	3.38	1.64						
14.5	12	4.05	1.82						
15.0	10	3.38	1.94						
15.5	8	2.70	2.11						
16.0	7	2.36	2.17						
16.5	3	1.01	2.48						
17.0	6	2.03	2.48						
17.5	10	3.38	2.98						
18.0	4	1.35	3.45						
18.5	3	1.01	3.74						

ELECTROFISHING CATCH	47 /hr	GILL NET CATCH	1 /lift	TRAP NET CATCH	0 /lift

* Average weights derived from district averages

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Monroe Reservoir Hybrid striped bass 5-6/07									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0	1	0.8	4.33	4
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0					22.0				
4.5	1	0.8	0.04	1	22.5	1	0.8	6.00	4
5.0	1	0.8	0.04	1	23.0				
5.5	3	2.4	0.07	1	23.5				
6.0	12	9.8	0.09	1	24.0	1	0.8	6.50	4
6.5	12	9.8	0.11	1	24.5				
7.0	3	2.4	0.14	1	25.0				
7.5	7	5.7	0.18	1	25.5				
8.0	3	2.4	0.21	1	26.0				
8.5	5	4.1	0.24	1	TOTAL	123	100		
9.0	4	3.3	0.34	1					
9.5	2	1.6	0.39	1					
10.0	4	3.3	0.44	1					
10.5	2	1.6	0.49	1					
11.0	1	0.8	0.60	2					
11.5	1	0.8	0.55	NA					
12.0									
12.5									
13.0									
13.5	6	4.9	1.11	2					
14.0	11	8.9	1.18	2					
14.5	7	5.7	1.37	2					
15.0	11	8.9	1.57	2,3					
15.5	8	6.5	1.70	2					
16.0	7	5.7	1.88	2,3					
16.5	1	0.8	1.90	2					
17.0	2	1.6	2.49	3					
17.5	2	1.6	2.83	3					
18.0	2	1.6	3.12	3					
18.5	2	1.6	3.23	3					

ELECTROFISHING CATCH	3/hr	GILL NET CATCH	4/lift	TRAP NET CATCH	0/lift

* Average weights derived from district averages

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Monror Reservoir Black crappie 5-6/07									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0					22.0				
4.5	2	3.8	0.04	1	22.5				
5.0					23.0				
5.5	2	3.8	0.07	2	23.5				
6.0	6	11.3	0.08	2,3	24.0				
6.5	8	15.1	0.12	2,3	24.5				
7.0	16	30.2	0.15	2,3	25.0				
7.5	9	17.0	0.18	3	25.5				
8.0	3	5.7	0.25	3,4	26.0				
8.5	1	1.9	0.00	4	TOTAL	53	100		
9.0	3	5.7	0.38	3,5,7					
9.5									
10.0									
10.5									
11.0	1	1.9	0.78	5					
11.5									
12.0									
12.5	1	1.9	0.93	5					
13.0									
13.5	1	1.9	1.34	7					
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	3 /hr	GILL NET CATCH	1/lift	TRAP NET CATCH	1 /lift

* Average weights derived from district averages

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Monroe Reservoir Walleye 5-6/07									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0	5	9.8	2.57	3,4
1.5					19.5	2	3.9	2.82	3
2.0					20.0	2	3.9	3.35	3
2.5					20.5	1	2.0	3.11	3
3.0					21.0	1	2.0	3.42	4
3.5					21.5				
4.0					22.0	3	5.9	3.87	4,5
4.5					22.5	1	2.0	4.05	6
5.0					23.0				
5.5					23.5				
6.0					24.0				
6.5					24.5	1	2.0	5.13	NA
7.0					25.0				
7.5					25.5				
8.0					26.0				
8.5	1	2.0	0.20	1	26.5	2	3.9	6.63	6,7
9.0	2	3.9	0.14	1	27.0	1	2.0	7.00	7
9.5	2	3.9	0.31	1	27.5				
10.0	1	2.0	0.33	1	28.0	1	2.0	9.00	8
10.5	1	2.0	0.35	1		51	100		
11.0	1	2.0	0.37	1					
11.5	1	2.0	0.56	1					
12.0									
12.5	1	2.0	0.72	1					
13.0	1	2.0	0.67	1					
13.5	3	5.9	0.86	2					
14.0	3	5.9	0.98	2					
14.5									
15.0	1	2.0	1.19	3					
15.5									
16.0	1	2.0	1.33	3					
16.5	3	5.9	1.50	2,3					
17.0		0.0							
17.5	3	5.9	1.88	3					
18.0	1	2.0	2.10	4					
18.5	5	9.8	2.29	3,5					

ELECTROFISHING CATCH	2 /hr	GILL NET CATCH	2/lift	TRAP NET CATCH	0/lift

* Average weights derived from district averages

Lake: Monroe Reservoir
Date: 5/21/2007 to 6/6/2007
Species: Gizzard shad

Length group (in)	Total # number	Sub-sample	Age 1	2	3	4	5	6
5.0	26	3	26					
5.5	8	1	8					
6.0	17	1	17					
6.5	639	12	160	479				
7.0	2260	5	904	1356				
7.5	1411	5		1411				
8.0	849	6		849				
8.5	395	5		395				
9.0	134	5		108	27			
9.5	109	4		55	55			
10.0	25	2			25			
10.5	17	2				17		
11.0	8	1						8
Total	5898	52	1115	4652	107	17	0	8

Growth Summary

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	1115	7.1	0.14	0.01	7.1	7.1
2	4652	7.7	0.41	0.01	7.7	7.8
3	107	9.7	0.12	0.03	9.7	9.8
4	17	10.8	0.00	0.00	10.7	10.8
5						
6	8	11.3	0.00	0.00	11.3	11.3

Lake: Monroe Reservoir
Date: 5/21/2007 to 6/6/2007
Species: White crappie

Length group (in)	Total number	Sub-sample	Age 1	2	3	4	5	6	7	8
4.0	4	2	4							
4.5	36	7	36							
5.0	157	6	157							
5.5	22	4	11	6	6					
6.0	66	3		66						
6.5	263	12		263	22					
7.0	248	5		198	50					
7.5	172	8		65	108					
8.0	128	10		13	77	51				
8.5	49	8		6	18	25				
9.0	21	4				21				
9.5	6	4				5	2			
10.0										
10.5	2	1					2			
11.0	22	4				5	11	5		
11.5	38	5					30	8		
12.0										
12.5	1	1					1			
13.0	18	2					9	9		
13.5	20	3					13	7		
14.0	9	1						9		
14.5	28	3					9			18
15.0	9	1							9	
Total	1318	94	207	617	280	107	77	38	9	18

Growth Summary

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	207	5.2	0.07	0.02	5.1	5.2
2	617	7.0	0.24	0.02	7.0	7.0
3	280	7.7	0.34	0.03	7.7	7.8
4	107	8.8	0.53	0.07	8.6	8.9
5	77	12.5	1.63	0.15	12.2	12.8
6	38	13.0	1.27	0.18	12.6	13.4
7	9	15.3	0.00	NA	NA	NA
8	18	14.8	0.00	0.00	14.8	14.8

Lake: Monroe Reservoir
Date: 5/21/2007 to 6/6/2007
Species: Bluegill

Length group (in)	Total number	Sub-sample	1	2	3	4	5	6	7
1.0									
1.5	21	8	21						
2.0	67	3	22						
2.5	115	4	115						
3.0	72	2		72					
3.5	125	8		125					
4.0	137	7		137					
4.5	139	4		70	70				
5.0	148	4		37	74		37		
5.5	100	6			83	17			
6.0	125	7				71	18	36	
6.5	80	4				20	20	20	20
7.0	51	7				36	15		
7.5	22	5				4	9	9	
8.0	2	1				2			
Total	1203	70	158	441	227	151	98	65	20

Growth Summary

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	158	2.5	0.13	0.03	2.5	2.6
2	441	4.1	0.34	0.03	4.1	4.2
3	227	5.3	0.17	0.03	5.2	5.3
4	151	6.6	0.31	0.05	6.5	6.7
5	98	6.3	0.78	0.09	6.1	6.4
6	65	6.6	0.26	0.06	6.5	6.7
7	20	6.8	0.00	0.00	6.7	6.8

Lake: Monroe Reservoir
Date: 5/21/2007 to 6/6/2007
Species: Yellow bass

Length group (in)	Total number	Sub-sample	Age 1	2	3	4	5	6	7
3.5	14	9	14						
4.0	180	6	180						
4.5	229	5	229						
5.0	8	5	8						
5.5	6	3		6					
6.0	30	1		30					
6.5	201	11		183	18				
7.0	188	9		167		21			
7.5	80	3			27		134	27	
8.0	108	10				11	32	43	22
8.5	35	5					7	21	7
9.0	11	5					2	7	2
Total	1090	72	431	386	45	32	175	98	31

Growth Summary

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	431	4.5	0.09	0.01	4.5	4.5
2	386	6.9	0.12	0.02	6.9	6.9
3	45	7.3	0.25	0.07	7.2	7.5
4	32	7.6	0.23	0.09	7.4	7.8
5	175	7.9	0.09	0.02	7.9	7.9
6	98	8.3	0.19	0.04	8.2	8.4
7	31	8.4	0.10	0.06	8.3	8.6

Lake: Monroe Reservoir
Date: 5/21/2007 to 6/6/2007
Species: White bass x striped bass

Length group (in)	Total number	Sub-sample	1	2	3	4
4.5	1	1	1			
5.0	1	1	1			
5.5	3	1	3			
6.0	12	10	12			
6.5	12	6	12			
7.0	3	3	3			
7.5	7	7	7			
8.0	3	3	3			
8.5	5	4	5			
9.0	4	4	4			
9.5	2	2	2			
10.0	4	3	4			
10.5	2	2	2			
11.0	1	1		1		
11.5	1					
12.0						
12.5						
13.0						
13.5	6	6		6		
14.0	11	7		11		
14.5	7	5		7		
15.0	11	6		9	2	
15.5	8	7		8		
16.0	7	7		5	2	
16.5	1	1		1		
17.0	2	2			2	
17.5	2	2			2	
18.0	2	2			2	
18.5	2	2			2	
19.0						
19.5						
20.0	1	1				1
20.5						
21.0						
21.5						
22.0						
22.5	1	1				1
23.0						
23.5						
24.0	1	1				1
Total	123	98	59	48	12	3

Growth Summary

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	59	7.6	2.26	0.20	7.2	8.0
2	48	14.9	0.96	0.14	14.6	15.2
3	12	17.3	1.51	0.36	16.6	18.0
4	3	22.4	4.08	1.17	20.1	24.8

Lake: Monroe Reservoir
Date: 5/21/2007 to 6/6/2007
Species: Black crappie

Length group (in)	Total number	Sub-sample	Age 1	2	3	4	5	6	7	8
1.0										
1.5										
2.0										
2.5										
3.0										
3.5										
4.0										
4.5	2	2	2							
5.0										
5.5	2	2		2						
6.0	6	6		4	2					
6.5	8	8		5	3					
7.0	16	6		5	11					
7.5	9	4			9					
8.0	3	3			1	2				
8.5	1	1				1				
9.0	3	3			1		1		1	
9.5										
10.0										
10.5										
11.0	1	1					1			
11.5										
12.0										
12.5	1	1					1			
13.0										
13.5	1	1							1	
Total	53	38	2	16	27	3	3	0	2	0

Growth Summary

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	2	4.75	0	0	4.75	4.75
2	16.33	6.67	0.28	0.13	6.41	6.93
3	26.67	7.40	0.37	0.12	7.17	7.63
4	3.00	8.42	0.08	0.17	8.08	8.75
5	3.00	11.08	3.08	1.01	9.06	13.11
6						
7	2.00	11.50	10.13	2.25	7.00	16.00

Lake: Monroe Reservoir
Date: 5/21/2007 to 6/6/2007
Species: Walleye

Length	Total	Sub-	Age							
group (in)	number	sample	1	2	3	4	5	6	7	8
8.5	1	1	1							
9.0	2	2	2							
9.5	2	1	2							
10.0	1	1	1							
10.5	1	1	1							
11.0	1	1	1							
11.5	1	1	1							
12.0										
12.5	1	1	1							
13.0	1	1	1							
13.5	3	3		3						
14.0	3	3		3						
14.5										
15.0	1	1			1					
15.5										
16.0	1	1			1					
16.5	3	3		2	1					
17.0										
17.5	3	3			3					
18.0	1	1				1				
18.5	5	5			4		1			
19.0	5	5			3	2				
19.5	2	2			2					
20.0	2	2			2					
20.5	1	1			1					
21.0	1	1				1				
22.0	3	3				2	1			
22.5	1	1						1		
24.5	1									
26.5	2	2						1	1	
27.0	1	1							1	
28.0	1	1								1
Total	51	49	11	8	18	6	2	2	2	1

Growth Summary

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	11	10.6	2.20	0.45	9.7	11.5
2	8	14.7	1.67	0.46	13.8	15.6
3	18	18.6	2.14	0.34	17.9	19.3
4	6	20.4	2.97	0.70	19.0	21.8
5	2	20.5	6.13	1.75	17.0	24.0
6	2	24.8	8.00	2.00	20.8	28.8
7	2	27.0	0.13	0.25	26.5	27.5
8	1	28.3	NA	NA	NA	NA

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Monroe Reservoir Walleye10/15-30/07									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0	5	3.1	2.50	2,3,4
1.5					19.5	2	1.2	2.68	7
2.0					20.0	1	0.6	2.94	2
2.5					20.5				
3.0					21.0	4	2.5	3.45	4,9
3.5					21.5	2	1.2	1.77	8
4.0					22.0	4	2.5	3.83	5
4.5					22.5	2	1.2	4.27	4
5.0					23.0	2	1.2	4.26	9
5.5					23.5	2	1.2	4.82	8
6.0	3	1.9	0.02	YOY	24.0	3	1.9	5.00	5,10
6.5	9	5.6	0.02	YOY	24.5	4	2.5	5.94	4,7,8
7.0	17	10.6	0.09	YOY	25.0	1	0.6	6.00	8
7.5	18	11.2	0.09	YOY	25.5	1	0.6	3.75	NA
8.0	20	12.4	0.15	YOY	26.0	1	0.6	6.25	8
8.5	13	8.1	0.20	YOY	26.5	2	1.2	4.00	7,9
9.0	11	6.8	0.18	YOY	27.0	3	1.9	7.92	8,9
9.5	9	5.6	0.25	YOY	27.5				
10.0	2	1.2	0.31	YOY	28.0	3	1.9	8.42	8,9
10.5						161	100		
11.0									
11.5									
12.0									
12.5									
13.0	1	0.6	0.74	1					
13.5	1	0.6	0.80	1					
14.0	2	1.2	0.92	1					
14.5	1	0.6	1.10	1					
15.0	1	0.6	1.12	1					
15.5									
16.0	2	1.2	1.33	2,3					
16.5	3	1.9	1.66	3					
17.0	3	1.9	1.86	4					
17.5									
18.0	2	1.2	2.24	NA					
18.5	1	0.6	2.25	NA					

ELECTROFISHING CATCH	16 /hr	GILL NET CATCH	2/lift	TRAP NET CATCH	0/lift

* Average weights derived from district averages

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Monroe Reservoir Hybrid striped bass 10/15-30/07									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0	1	0.5	2.90	2
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0	2	1.0	2.25	3
3.5					21.5	2	1.0	4.60	5
4.0					22.0	3	1.6	4.75	5
4.5	1	0.5	0.05	YOY	22.5				
5.0	6	3.1	0.05	YOY	23.0	5	2.6	5.25	5,6
5.5	16	8.3	0.07	YOY	23.5	1	0.5	5.50	5
6.0	11	5.7	0.10	YOY	24.0	5	2.6	6.65	7,8,9
6.5	14	7.3	0.14	YOY	24.5	6	3.1	6.38	6,7,8,9,10
7.0	16	8.3	0.17	YOY	25.0	2	1.0	6.75	9
7.5	4	2.1	0.19	YOY	25.5	2	1.0	7.63	6,9
8.0	2	1.0	0.24	1	26.0				
8.5	2	1.0	0.24	1	26.5	1	0.5	8.25	8
9.0	11	5.7	0.30	1	TOTAL	193	100		
9.5	18	9.3	0.36	1					
10.0	9	4.7	0.39	1					
10.5	10	5.2	0.47	1					
11.0	6	3.1	0.54	1					
11.5	6	3.1	0.60	1					
12.0	9	4.7	0.72	1					
12.5	2	1.0	0.86	1					
13.0	1	0.5	0.96	1					
13.5	2	1.0	0.87	1					
14.0	3	1.6	1.17	1					
14.5				1					
15.0	2	1.0	1.04	1					
15.5									
16.0	3	1.6	1.86	1,2					
16.5									
17.0	1	0.5	2.31	2					
17.5	3	1.6	3.15	2,3					
18.0	3	1.6	2.85	2					
18.5	2	1.0	2.84	2					

ELECTROFISHING CATCH	18/hr	GILL NET CATCH	3/lift	TRAP NET CATCH	0/lift

* Average weights derived from district averages

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Monroe Reservoir Channal catfish 10/15-30/07									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0	5	4.2	2.21	
1.5					19.5	6	5.1	1.91	
2.0					20.0	5	4.2	1.16	
2.5					20.5	4	3.4	2.76	
3.0					21.0	1	0.8	3.25	
3.5					21.5	1	0.8	3.75	
4.0					22.0	4	3.4	3.59	
4.5					22.5	2	1.7	4.55	
5.0					23.0	4	3.4	4.70	
5.5					23.5				
6.0					24.0	3	2.5	4.98	
6.5					24.5	1	0.8	6.25	
7.0					25.0	3	2.5	5.83	
7.5					25.5	1	0.8	6.75	
8.0					26.0	2	1.7	6.63	
8.5					26.5				
9.0					27.0	2	1.7	8.00	
9.5					27.5	2	1.7	8.50	
10.0	1	0.8	0.26		28.0				
10.5					28.5	1	0.8	10.25	
11.0	1	0.8	0.40		29.0				
11.5	3	2.5	0.00		29.5	2	1.7	10.50	
12.0	4	3.4	0.39		30.0	1	0.8	12.25	
12.5	1	0.8	0.65		30.5				
13.0	3	2.5	0.43		31.0				
13.5	6	5.1	0.82		31.5	1	0.8	10.55	
14.0	7	5.9	0.68		TOTAL	118	100.0		
14.5	5	4.2	0.63						
15.0	7	5.9	0.62						
15.5	8	6.8	1.01						
16.0	4	3.4	1.25						
16.5	3	2.5	1.43						
17.0	4	3.4	1.62						
17.5	2	1.7	1.77						
18.0	5	4.2	1.88						
18.5	3	2.5	1.83						

ELECTROFISHING CATCH	1 /hr	GILL NET CATCH	6/lift	TRAP NET CATCH	0/lift

* Average weights derived from district averages

Lake: Monroe Lake Fall Evaluation
Date: 10/15/2007 to 10/30/2007
Species: Walleye

Length	Total #	Sub-	Age									
group (in)	number	sample	1	2	3	4	5	6	7	8	9	10
6.0	3											
6.5	9											
7.0	17											
7.5	18	2										
8.0	20	1										
8.5	13	1										
9.0	11	2										
9.5	9	2										
10.0	2	1										
10.5												
13.0	1	1	1									
13.5	1	1	1									
14.0	2	2	2									
14.5	1	1	1									
15.0	1	1	1									
15.5												
16.0	2	2		1	1							
16.5	3	1			3							
17.0	3	1				3						
17.5												
18.0	2											
18.5	1											
19.0	5	3		2	2	2						
19.5	2	1							2			
20.0	1	1		1								
20.5												
21.0	4	2				2					2	
21.5	2	1								2		
22.0	4	1					4					
22.5	2	1				2						
23.0	2	1									2	
23.5	2	1								2		
24.0	3	2					2					2
24.5	4	4				1			2	1		
25.0	1	1								1		
25.5	1											
26.0	1	1								1		
26.5	2	2							1		1	
27.0	3	3								2	1	
27.5												
28.0	3	2								2	2	
Total	161	46	6	4	6	10	6	0	5	11	8	2

Lake: Monroe Lake Fall Evaluation
Date: 10/15/2007 to 10/30/2007
Species: Walleye

Growth Summary

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	6	14.3	0.50	0.29	13.7	14.8
2	4	18.7	3.34	0.95	16.8	20.6
3	6	17.4	1.78	0.56	16.3	18.5
4	10	20.3	7.31	0.87	18.6	22.1
5	6	22.8	0.97	0.42	22.0	23.6
6						
7	5	23.2	10.30	1.44	20.3	26.0
8	11	25.2	5.44	0.72	23.7	26.6
9	8	24.7	8.86	1.09	22.5	26.9
10	2	24.3	0.00	0.00	24.3	24.3

Lake: Monroe Reservoir Fall Evaluation
Date: 10/15/2007 to 10/30/2007
Species: White bass x striped bass

Length group (in)	Total # number	Sub-sample	Age 1	2	3	4	5	6	7	8	9	10
4.5	1											
5.0	6	6										
5.5	16	10										
6.0	11	4										
6.5	14	11										
7.0	16	15										
7.5	4	4										
8.0	2	2	1									
8.5	2	2	1									
9.0	11	7	11									
9.5	18	8	18									
10.0	9	7	9									
10.5	10	9	10									
11.0	6	4	6									
11.5	6	6	1									
12.0	9	9	9									
12.5	2	2	2									
13.0	1	1	1									
13.5	2	2	2									
14.0	3	3	3									
14.5												
15.0	2	1	2									
15.5												
16.0	3	3	1	2								
16.5												
17.0	1	1		1								
17.5	3	3		2	1							
18.0	3	3		3								
18.5	2	2		2								
19.0	1	1		1								
19.5												
20.0												
20.5												
21.0	2	2			2							
21.5	2	2					2					
22.0	3	3					3					
22.5												
23.0	5	5					1	4				
23.5	1	1					1					
24.0	5	5							1	2	2	
24.5	6	6						2	1	1	1	1
25.0	2	1									2	
25.5	2	2						1			1	
26.0												
26.5	1	1								1		
Total	193	154	77	11	3	0	7	7	2	4	6	1

Lake: Monroe Reservoir Fall Evaluation
Date: 10/15/2007 to 10/30/2007
Species: White bass x striped bass

Growth Summary

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	77	10.9	2.84	0.19	10.5	11.3
2	11	17.9	0.95	0.29	17.3	18.5
3	3	20.1	4.08	1.17	17.8	22.4
4						
5	7	22.5	0.57	0.29	21.9	23.0
6	7	24.0	1.07	0.39	23.3	24.8
7	2	24.5	0.13	0.25	24.0	25.0
8	4	25.0	1.42	0.60	23.8	26.2
9	6	24.9	0.37	0.25	24.4	25.4
10	1	24.8	NA	NA	NA	NA